5   SYSTEMS AND METHODS FOR MODELING THE IMPACT OF A
           MEDIUM ON THE APPEARANCES OF ENCOMPASSED LIGHT SOURCES

Abstract

The present invention provides systems and methods for modeling the impact of a

10   medium on the appearances of encompassed light sources using a Legendre polynomial series

solution to a Radiative Transfer Equation for Spherical Media (RTE-SM) called an

Atmospheric Point Spread Function (APSF). Using this APSF, it is possible to determine

characteristics of the medium causing the multiple scattering of the light from the

encompassed light source. For example, by observing a street light in bad weather at night,

15   using the APSF, it is possible to determine whether the bad weather is haze, mist, fog, or rain.

Similarly, the APSF may be used to estimate the size of particles in a liquid. It is also

possible using the APSF to remove and/or add an effect of the medium on a light source

captured in an image.